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Technology (A Special Report)

What's Ahead For... .Tobacco: Vector's new cigarette won't be safe; It may be safer, though

By Gordon Fairclough
Staff Reporter

Cigarettes cause disease and are addictive. And efforts to make them less dangerous haven't gotten far. But now, maverick tobacco company Vector Group Ltd. is trying to solve part of the problem at its roots.

Vector, the parent of cigarette maker Liggett Group, has come up with a way to turn off a gene in the roots of tobacco plants that is critical to the production of nicotine. The result: tobacco that contains virtually none of the addictive substance that keeps smokers hooked.

The genetically modified plants also are nearly free of a group of cancer-causing chemicals known as tobacco-specific nitrosamines, the company says. Vector plans to use the new tobacco to make nonaddictive cigarettes that could be used to wean people off smoking. The new smokes are expected to hit U.S. store shelves early next year. If the cigarettes are successful in the U.S., Vector plans to introduce them in Europe and elsewhere. But there's no definite timetable.

Vector also intends to combine the genetically modified tobacco with another innovation. Company scientists have come up with a way to remove a second class of carcinogens -- large polycyclic aromatic hydrocarbons -- from cigarette smoke by treating tobacco with a chemical mixture that includes palladium, a metal most commonly used in the catalytic converters of cars.

Putting the two technologies together, Vector says, will allow it to significantly decrease levels of two of the most potent kinds of carcinogens in cigarettes, in addition to producing a product that isn't addictive. And that could help push down cancer rates among smokers, says David Burns, a medical professor at the University of California at San Diego and an expert on the health effects of smoking.

Even if Vector succeeds, however, it will not have made smoking safe. Cigarettes cause plenty of serious ailments other than cancer, including emphysema, chronic pulmonary obstructive disease and cardiovascular problems. What's more, public-health experts fear that newfangled cigarettes may

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discourage smokers from quitting or encourage nonsmokers to light up because smoking may seem less risky.

Vector's chairman, Bennett S. LeBow, who quit a two-pack-a-day habit about 30 years ago, got interested in the project back in 1997, when he saw a news report that a patent had been issued for nicotine-free tobacco.

Mr. LeBow, a Wall Street financier who bought Liggett in 1986, faxed a copy of the report to executives at the cigarette maker's Durham, North Carolina, headquarters with a note scrawled on the top: "Look into this."

Ronald Fulford, Liggett's chief executive at the time, says he thought no-nicotine cigarettes could give a big boost to Vector, which has a market share of just 1.5% and makes mostly generic brands. "If we could do it quickly enough and well enough, we could create a category and become the leader," says Mr. Fulford, who has since retired.

Vector ended up negotiating world-wide rights to the invention, which is the brainchild of Mark Conkling, a molecular biologist who specializes in plant genetics. Tobacco plants make nicotine in their roots and then transport it to the leaves, where it functions as a kind of natural insecticide. In 1994, Dr. Conkling, then a professor at North Carolina State University, and one of his graduate students, Wen Song, discovered a tobacco-plant gene that they thought regulated the manufacture of nicotine. Two years of experiments later, they proved they were right.

Dr. Conkling's breakthroughs were happening as criticism of Big Tobacco was reaching its height. The major American cigarette makers were facing lawsuits from state governments, and company executives were being grilled on Capitol Hill. The U.S. Food and Drug Administration was trying to exert jurisdiction over the industry. "The university wouldn't touch" his discovery, Dr. Conkling says. He called Philip Morris Cos. and R.J. Reynolds Tobacco Holdings Inc., the two biggest cigarette makers in the U.S. Neither was interested, he says.

In 1998, Vector got involved. At the time, Dr. Conkling says, he still wasn't sure whether he could turn off the nicotine-regulating gene without killing the tobacco plant. "I would have bet a month's salary, but not a year's" on the outcome, he says. Vector made sure he had the funding to find out.

Dr. Conkling succeeded in shutting down the critical gene and virtually blocking the formation of nicotine without affecting the viability of the plant or the taste of the cigarettes -- though the nicotine hit is absent, Vector says. By mid-1999, Dr. Conkling was raising the new plants in greenhouses at North Carolina State and producing seeds -- which are black and the size of grains of sand -- for field trials.

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Vector hasn't had an easy time, however, growing its genetically modified tobacco. Philip Morris, British American Tobacco PLC and other companies lobbied government officials in Argentina to curb cultivation of the crop, saying they feared that it would get mixed with the regular tobacco they buy in the country. The Argentine authorities ordered the genetically modified tobacco seized and burned because the company Vector hired to plant it didn't have the permits required to import the seeds.

The U.S. government has approved planting of the new tobacco. But farmers in the traditional tobacco-growing states of the American southeast also have refused to grow it.

The farmers and Vector's cigarette-industry rivals say they fear switching to the new strain because of the danger of a consumer backlash against genetically altered crops, especially in Europe and Japan. They say that smokers, who puff away despite the well-known health hazards of smoking, could well stop buying brands they think contain genetically altered material, concerned about its safety.

Vector's Mr. LeBow thinks that's nonsense, and complains that his bigger competitors are just trying to throw roadblocks in his path. "They can try to stall me," he says. "But I don't see how they believe they could kill this."

Dr. Conkling, who now works for Vector, says there is no scientific basis for concern about the new tobacco. The changes have been very minor, he says -- turning off one gene and implanting a second one as a marker to identify the modified plants. Other scientists who aren't connected with Vector agree. Earl Wernsman, who recently retired from his job as a professor of crop science and genetics at North Carolina State, says Dr. Conkling's tinkering hasn't made tobacco any more dangerous than it was already.

Vector has now contracted with farmers in Pennsylvania, Illinois, Louisiana and Mississippi to start growing the plants this season. The company says it expects to have enough tobacco to begin manufacturing its no-nicotine cigarettes by early next year.

The company is planning to market the new cigarettes under the brand name Omni Free. Executives say they are planning to spend about \$50 million (&59 million) promoting and advertising the new brand as well as a line of other cigarettes that the company says will contain lower levels of some carcinogens than regular smokes. Ads for the no-nicotine cigarettes will be built around the theme that people will be able to smoke because they want to, not because they have to.

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Vector expects its message to resonate with smokers, about three-quarters of whom say in surveys that they would like to quit. The company envisions smokers using Omni Free to gradually wean themselves from nicotine. And it plans to eventually seek approval from the FDA to market the cigarettes explicitly as a smoking-cessation aid. Vector also believes the cigarettes will be popular with people who smoke only socially and don't want to risk becoming addicted to nicotine. "If we help people stop smoking, that's a huge market for us," says Mr. LeBow. And, since Vector has such a small share of the U.S. cigarette market, capturing even a modest percentage of smokers with its new cigarette would translate into a big sales increase for the company.

Cigarettes made from Vector's new tobacco contain 0.24 milligram of nicotine, well below the level that some experts consider addictive. There are other filtered cigarettes on the market that advertise lower nicotine levels, based on a Federal Trade Commission method that measures the nicotine delivered under standardized laboratory conditions. But scientists and even tobacco companies admit that the FTC's measurements don't accurately assess how much nicotine smokers actually take in, because smokers tend to block ventilation holes, inhale more deeply and take more puffs from a cigarette in order to extract as much tar and nicotine as possible.

That wouldn't be the case with Vector's cigarette. "If the nicotine isn't there, you can't get it, no matter how hard you smoke," says Jack E. Henningfield, a researcher at Johns Hopkins University, Baltimore.

----- INDEX REFERENCES -----

COMPANY (TICKER): Vector Group Ltd. (VGR)

NEWS SUBJECT: Agriculture; High-Yield Issuers; Research & Development;
Research/Development; Science & Technology;
Science/Technology; English language content;
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